**Form PTO-1449 Modified**

List of Patent and Publications
Cited by Applicant
(Use several sheets if necessary)

U.S. Department of Commerce
Patent and Trademark Office

Docket No.
HER-0041

Serial No.
09/813,408

Applicant
Simon Delagrave et al.

Filing Date
March 21, 2001

Group
1645

U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
MCB	CC	4,458,066	07/03/84	Caruthers, et al.	536	27
	CD	5,723,323	03/03/98	Kauffman et al.	435	172.3
	CE	5,763,192	06/09/98	Kauffman et al.	435	7.1
	CF	5,814,476	09/29/98	Kauffman et al.	435	69.1
	CG	5,817,483	10/06/98	Kauffman et al.	435	69.1
	CH	5,914,245	06/22/99	Bylina, et al.	435	19
	CI	5,935,527	08/10/99	Andrus, et al.	422	131
	CJ	5,942,609	08/24/99	Hunkapiller, et al.	536	25.3
	CK	6,117,679	09/12/00	Stemmer	435	440
MCB	CL	6,171,820 B1	01/09/01	Short	435	69.1

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Examiner Initial		Document No.	Date	Country	Translation YES NO	
MCB	CM	0 406 937	01/09/91	EPO		
MCB	CN	WO 83/02626	08/04/83	PCT		

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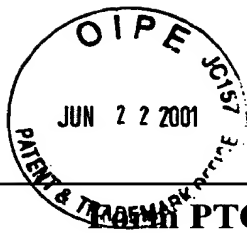
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Sheet 1 of 6

PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office		Docket No. HER-0041	Serial No. 09/813,408
		Applicant Simon Delagrave et al.	
		Filing Date March 21, 2001	Group 1645
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
<i>mc5</i>	AA	Arkin, A. et al., "An algorithm for protein engineering: Simulations of recursive ensemble mutagenesis", <i>Proc. Natl. Acad. Sci. USA</i> , August 1992 , 89, 7811-7815	
	AB	Beattie, K. et al., "Solid-phase gene assembly", <i>Nature</i> , August 8, 1991 , 352, 548-549 and 742	
	AC	Chapman, D. et al., "Nucleotide and deduced amino acid sequence of <i>stp</i> : The bacteriophage T4 anticodon nuclease gene", <i>J. Mol. Biol.</i> , 1988 , 199, 373-377	
	AD	Chen, H., et al., "A new method for the synthesis of a structural gene", <i>Nucleic Acids Research</i> , January 25, 1990 , 18(4), 871-878	
	AE	Chen, K., et al., "Tuning the activity of an enzyme for unusual environments: sequential random mutagenesis of subtilisin E for catalysis in dimethylformamide," <i>Proc. Natl. Acad. Sci. USA</i> , 1993 , 90, 5618-5622	
	AF	Chen, K., et al., "Enzyme engineering for nonaqueous solvents: random mutagenesis to enhance activity of subtilisin E in polar organic media," <i>Biotechnology</i> , 1991 , 9, 1073-1077	
	AG	Chu, B.C.F., et al., "Ligation of oligonucleotides to nucleic acids or proteins via disulfide bonds," <i>Nuc. Acids Res.</i> , 1988 , 16(9), 3671-3691	
	AH	Coco, et al., "DNA shuffling method for generating highly recombined genes and evolved enzymes", <i>Nature Biotechnology</i> , 2001 , 19, 354	
	AI	Delagrave, S., et al., "Recursive ensemble mutagenesis," <i>Protein Eng.</i> , 1993 , 6, 327-331	
	AJ	Dove, A., "Opinions evolve on Kauffman patent", <i>Nature Biotechnology</i> , April 2000 , 18, 373	
	AK	Harada, K., et al., "In vitro selection of optimal DNA substrates for T4 RNA ligase," <i>Proc. Natl. Acad. Sci., USA</i> , 1993 , 90, 1576-1579	
✓	AL	Heaphy, S. et al., "Effect of single amino acid changes in the region of the adenylation site of T4 RNA ligase", <i>Biochemistry</i> , 1987 , 26(6), 1688-1696	
<i>mc5</i>	AM	Ho, S. et al., "Site-directed mutagenesis by overlap extension using the polymerase chain reaction", <i>Gene</i> , 1989 , 77, 51-59	
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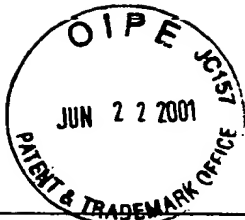
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mcs	AN	Horn, T., et al., "A chemical 5'-phosphorylation of oligodeoxyribonucleotides that can be monitored by trityl cation release," <i>Tetra. Lett.</i> , 1986 , 27, 4705-4708
	AO	Horton R. et al., "Engineering hybrid genes without the use of restriction enzymes: gene splicing by overlap extension", <i>Gene</i> , 1989 , 77, 61-68
	AP	Hostomský, Z. et al., "Solid-phase assembly of cow colostrum trypsin inhibitor gene", <i>Nucleic Acids Research</i> , 1987 , 15, 4849-4856
	AQ	Hostomský, Z. et al., "Solid-phase assembly of DNA duplexes from synthetic oligonucleotides", <i>Nucleic Acids Research</i> , 1987 , Symposium Series No. 18, 241-244
	AR	Howitt C., "Improved ligation-anchored PCR strategy for identification of 5' ends of transcripts", <i>BioTechniques</i> , July 1996 , 21, 34-38
	AS	Isono, Y., et al., "Purification and reaction of a new enzyme, nucleoside oxidase," <i>Agric. Biol. Chem.</i> , 1989 , 53, 1663-1669
	AT	Ivanov, I. et al., "Two methods for rapid assembly and oligomerization of synthetic genes: construction of human calcitonin-encoding sequences", <i>Gene</i> , 1990 , 95, 295-299
	AU	Joo, H., et al., "A high-throughput digital imaging screen for the discovery and directed evolution of oxygenases," <i>Chem. Biol.</i> , 1999 , 6(10), 699-706
	AV	Joo, H., et al., "Laboratory evolution of peroxide-mediated cytochrome P450 hydroxylation," <i>Nature</i> , 1999 , 399, 670-673
	AW	Kinoshita, Y. et al., "Unexpectedly general replaceability of ATP in ATP-requiring enzymes", <i>J. Biochem.</i> , 1997 , 122, 205-211
	AX	Kinoshita Y., et al., "Fluorescence-, isotope- or biotin-labeling of the 5' -end of single-stranded DNA/RNA using T4 RNA ligase", <i>Nucleic Acids Research</i> , 1997 , 25, 3747-3748
↓	AY	Krug, M. et al., "Reversal of T4 RNA ligase", <i>Biochemistry</i> , 1982 , 21(8), 1858-1864
mcs	AZ	Leung, D.W., et al., "A method for random mutagenesis of a defined DNA segment using a modified polymerase chain reaction," <i>J. Methods in Cell and Molec. Biol.</i> , 1989 , 1, 11-15

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<i>mcb</i>	BA	Marrs, B., et al., "Novel approaches for discovering industrial enzymes," <i>Curr. Opin. Microbiol.</i> , 1999 , 2, 241-245	
	BB	McLaughlin, L. et al., "Donor activation in the T4 RNA ligase reaction", <i>Biochemistry</i> , 1985 , 24, 267-273	
	BC	Miyazaki, K., et al., "Exploring nonnatural evolutionary pathways by saturation mutagenesis: rapid improvement of protein function," <i>J. Mol. Evol.</i> , 1999 , 49, 716-720	
	BD	Mudrakovskaia, A.V., et al., "Solid-phase enzymatic synthesis of oligoribonucleotides," <i>Plenum Publ. Corp.</i> , 1992 , translated from <i>Bioorganicheskaya Khimiya</i> , 17(6), 1991 , 819-822; <i>Plenum Publishing Corp.</i> , 1992 , 469-472	
	BE	Mullinax, R. et al., "Expression of a heterodimeric Fab antibody protein in one cloning step", <i>BioTechniques</i> , 1992 , 12, 864-869	
	BF	Nijhuis, M. et al., "Enzymatically produced composite primers" An application of T4 RNA ligase-coupled primers to PCR", <i>BioTechniques</i> , 1995 , 19, 182-186	
	BG	Nishigaki, K. et al., "Y-ligation: An efficient method for ligating single-stranded DNAs and RNAs with T4 RNA ligase", <i>Molecular Diversity</i> , 1998 , 4, 187-190	
	BH	Pantoliano, M. et al., "Large increases in general stability for subtilisin BPN' through incremental changes in the free energy of unfolding," <i>Biochemistry</i> , 1989 , 28, 7205-7213	
	BI	Pierce, J., "In-frame cloning of large synthetic genes using moderate-size oligonucleotides", <i>BioTechniques</i> , 1994 , 16(4), 708-714	
<i>↓</i>	BJ	Profy, A. et al., "Synthesis of 2' (3')-O-DL-alanyl hexainosinic acid using T4 RNA ligase: suppression of the enzymic reverse transfer reaction by alkaline phosphatase", <i>Nucleic Acids Research</i> , 1983 , 11(5), 1617-1633	
<i>mcb</i>	BK	Rand, K. et al., "Sequence and cloning of bacteriophage T4 gene 63 encoding RNA ligase and tail fibre attachment activities", <i>The EMBO Journal</i> , 1984 , 3(2), 397-402	
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Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office		Docket No. HER-0041	Serial No. 09/813,408	
		Applicant Simon Delagrave et al.		
		Filing Date March 21, 2001	Group 1645	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)				
* <i>mc6</i>	BL	Sambrook, et al. (eds.), <i>Molecular Cloning: A Laboratory Manual</i> , Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989		
* <i>mc6</i>	BM	Sambrook, et al., <i>Molecular Cloning a Laboratory Manual, 2nd Ed.</i> , cold Spring Harbor Press, 1989		
↓	BN	Schmitz C. et al., "Solid-phase enzymatic synthesis of oligonucleotides", <i>Org. Lett.</i> , 1999, 1(11) , 1729-1731		
	BO	Sillero, A. et al., "Synthesis of dinucleoside polyphosphates catalyzed by firefly luciferase and several ligases", <i>Pharmacology & Therapeutics</i> , 2000, 87 , 91-102		
	BP	Sninsky, J. et al., "The use of terminal blocking groups for the specific joining of oligonucleotides in RNA ligase reactions containing equimolar concentrations of acceptor and donor molecules", <i>Nucleic Acids Research</i> , 1976, 3(11) , 3157-3166		
	BQ	Stahl, S. et al, "Solid-phase gene assembly of constructs derived from the <i>Plasmodium falciparum</i> malaria blood-stage antigen Ag332", <i>BioTechniques</i> , 1993, 11(3) , 425-434		
	BR	Stemmer, W. et al., "Single-step assembly of a gene and entire plasmid from large numbers of oligodeoxyribonucleotides", <i>Gene</i> , October 16, 1995, 164(1) , 49-53		
	BS	Stemmer, W., "DNA shuffling by random fragmentation and reassembly: <i>In vitro</i> recombination for molecular evolution", <i>Proc. Natl. Acad. Sci. USA</i> , October 1994, 91 , 10747-10751		
	BT	Sugino A. et al., "Bacteriophage T4 RNA ligase. Reaction intermediates and interaction of substrates", <i>J Biol Chem</i> , March 10, 1977, 252(5) : 1732-8		
	BU	Tessier, D.C., et al., "Ligation of single-stranded oligodeoxyribonucleotides by T4 RNA ligase," <i>Analytical Bioc.</i> , 1986, 158 , 171-178		
	✓	BV	Uemura, A., et al., "Lipase-catalyzed regioselective acylation of sugar moieties of nucleosides," <i>Tetra. Letts.</i> , 1989, 30(29) , 3817-3818	
	<i>mc6</i>	BW	Uhlenbeck, O. et al., "Equimolar addition of oligoribonucleotides with T4 RNA ligase", <i>Nuceic Acids Research</i> , 1977, 4(1) , 85-98	
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* A copy of these references will not be forwarded to the U.S. Patent and Trademark Office since it is believed to be too voluminous and easily obtainable by the Examiner



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Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office		Docket No. HER-0041	Serial No. 09/813,408
		Applicant Simon Delagrave et al.	
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
MCS	BX	Wong, C., et al., "Enzymes in organic synthesis: use of subtilisin and a highly stable mutant derived from multiple site-specific mutations," <i>J. Am. Chem. Soc.</i> , 1990 , <i>112</i> , 945-953	
	BY	Ye, Q. et al., "Gene synthesis and expression in <i>E. coli</i> for PUMP, a human matrix metalloproteinase", <i>Biochem. Biophys. Res. Commun.</i> , July 15, 1992 , <i>186(1)</i> , 143-149	
	BZ	You, L., et al., "Directed evolution of subtilisin E in <i>Bacillus subtilis</i> to enhance total activity in aqueous dimethylformamide," <i>Protein Eng.</i> , 1994 , <i>9(1)</i> , 77-83	
✓	CA	Yu, Y. et al., "A new strategy for introducing photoactivatable 4-thiouridine (⁴⁸ U) into specific positions in a long RNA molecule", <i>RNA</i> , 1997 , <i>3</i> , 807-810	
MCS	CB	Zhang, X., et al., "Single-stranded DNA ligation by T4 RNA ligase for PCR cloning of 5'-noncoding fragments and coding sequence of a specific gene," <i>Nuc. Acids Res.</i> , 1996 , <i>24(5)</i> , 990-991	
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				Filing Date 03/22/01		Group 1645			
U. S. PATENT DOCUMENTS									
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FOREIGN PATENT DOCUMENTS									
Examiner Initial		Document No.	Date	Country	Translation YES NO				
<i>mcb</i>	AA	00/58517 A1	10/05/00	PCT	—	—			
<i>mcb</i>	AB	00/77261/A1	12/21/00	PCT	—	—			
EXAMINER <i>2994</i>				DATE CONSIDERED <i>12/10/02</i>					

PTO-1449 (MODIFIED)	ATTY. DOCKET NO. 10102		SERIAL NO. 09/813,408
	APPLICANT(S) Simon Delagrave AND Barry Marrs		
	FILING DATE March 22, 2001		GROUP 1645

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EXAMINER* INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLAS S	FILING DATE IF RELEVANT
MOB	—	5,605,793	02/25/97	Stemmer	—	—	—

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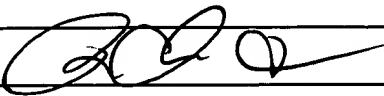
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							YES	NO

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EXAMINER 	DATE CONSIDERED 12/10/02
EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and <u>not considered</u> . Include copy of this form with next communication to applicant.	